

**ABSTRACT**

In a consumable electrode type arc welding machine, an arc resistance calculator for calculating an arc resistance from the welding current and the welding voltage is provided. The welding current and the welding voltage are controlled by making use of a short-circuit waveform control signal and an arc waveform control signal which change in accordance with the arc resistance signal. This suppresses the sputtering phenomenon and ensures the stability of arc. Furthermore, if arc resistance signal goes higher than a certain specific level for a certain time in an arc period, a constant-current control signal is output so as to control the welding current to be a constant-current with a certain current value that is higher than that output at the moment when arc waveform control signal is output. This prevents the occurrence of an arc break.